

6 inches aperture and  $4\frac{1}{2}$  feet focal length, and the mounting is a striking change from what we are usually accustomed to see. The great point to be attained by it is to carry the telescope equatorially and allow it to move on a declination axis in such a manner that the eye-end remains stationary while sweeping the heavens. It will be seen from the plate which, by the kindness of Dr. Carl, we are able to reproduce, that the declination axis is carried above the polar axis somewhat in the usual way, but that the telescope, instead of being carried by its middle at the end of the declination axis, is carried by a frame, O, so that the eyepiece is in the prolongation of that axis, and also in the prolongation of the polar axis, so that it remains stationary, while the object-glass sweeps in all directions. The handles D and N, within easy reach of the observer, enable him to give the requisite motion to the telescope without the change of position necessary with an ordinary instrument. The telescope is balanced on the declination axis F by the counter-weight Q, and the excess of weight on one side of the polar axis is balanced by the counter-weights Q Q Q.

Herr Schneider proposes to mount telescopes of much greater size, say 30 or 40 feet long, in the same manner.

### NOTES

M. MILNE-EDWARDS having completed the publication of his great work on "Physiologie Comparée," a subscription has been opened by M. Dumas, the Perpetual Secretary of the Academy of Sciences, for the purpose of presenting the veteran zoologist with a gold medal. Subscriptions are to be sent to M. Maindron at the Secretariat of the Academy of Sciences, or to M. Victor Masson, publisher, Boulevard St. Germain, Paris. M. Milne-Edwards's great work is composed of fourteen large octavo volumes—the first four of which are out of print—of 500 pages each; the publication began in 1857, and has been accomplished by twenty-three years of continual work. It includes all the lectures which have been delivered by M. Milne-Edwards at the Museum of Natural History during that lengthened period, and could not have been accomplished if the author had not had the advantage of the immense scientific resources accumulated in that establishment during the last two centuries for the study of nature.

A VIENNA correspondent sends us the following data regarding the Agram earthquake:—The damp ejected matter of the mud-volcano at Resnica near Agram was found to contain no elementary sulphur nor sulphuretted hydrogen, but it contained sulphur metals decomposable by acids, and earthy carbonates, along with organic substances of a humus nature. The chief constituent of it is fine sand with water, and it comes from no great depth. The mud-volcano at Sevet, near Agram, also ejects (2 m. high) chiefly a clayey-sandy mud, which may be thrown up by movements of the ground water. The Gratz geologist, Peters (writing in the *Tagespost*), characterises the Agram earthquake of November 9 to 14 as one of the most normal which could be observed in that region. The movement kept exactly the direction of south-south-west, and was thus precisely at right angles to the chief direction of the Eastern Alps. The entire breadth of the territory affected appears to be indicated by the towns of Klagenfurt (Carinthia) and Szegedin (Hungary). Since the formation of the Alps, and so through a long series of geological periods, all subterranean movements in this region of Central Europe have been in this one direction (as Süss first showed). For some months past movements have been perceived to be in progress in various localities. That Agram should be affected as it has been is explained by an inspection of the geological map. Not very far north from that town rises a remarkable block of greenstone surrounded by chlorite schist, limestone and other layers. A not very broad band of recent

Tertiary deposits separates the low ground from that mountain block, which thus forms a comparatively fixed point in the system. Every movement coming from south-south-west propagated by these strata must impinge horizontally on the greenstone block, and cause a greater or less curvature of the strata, which manifests itself most where the lower ground remains free from Tertiary deposits. Unfortunately for Agram the strongest movement was directed precisely against that mountain block, and so upon the town before it. The whole phenomenon has nothing to do with volcanic processes. The repetition of the shocks is easily explained by the reaction from curvature of the strata not occurring all at once. In opposition to Peters, the astronomer and meteorologist, Rudolph Falb of Gratz, holds the Agram earthquake to be volcanic, and connected with the strong attraction of subterranean lava by the moon. They seem to have continued at more or less frequent intervals during the past week.

IN several parts of the Tyrol (Hall, Thaur, Rum, Innsbruck) an earthquake-shock was experienced on the 14th inst. about 9.15 a.m., and on the same day there was a considerable shock (lasting 20 sec.) in Bavaria, at Partenkirchen and Mittenwald about 8 p.m. Dr. Franz Woehner has been delegated by the Vienna Academy to Croatia to report on the phenomena.

A CYCLONE accompanied by earthquake shocks is reported to have occurred at Sitka in Alaska on October 25, causing much devastation.

JUST after the death of its founder, Dr. Broca, the well-known *Revue d'Anthropologie* entered on its tenth year. His successor in the direction of the *Revue*, Dr. Topinard, issues a prospectus intimating that it will be continued with renewed energy on the lines laid down by its founder. The *Revue* embraces all the varied departments of anthropology, and its editor has the collaboration of the most eminent workers in the varied departments in France. Broca left a great number of anthropological papers in various stages of completeness, and these are to be published in successive numbers of the *Revue*, which deserves every encouragement.

THE laboratory of M. Lacazes Duthiers at the Sorbonne has been opened this year again for experiments in zoology. In the summer it will be transferred to the coast station in Brittany.

THE Paris Museum of Natural History being situated in a somewhat out-of-way place, is rather deserted by the students, and great efforts are made to render the course of lectures which are delivered there unusually attractive. M. Fremy, Lecturer on Chemistry, will speak on the great discoveries in chemistry made almost simultaneously in Paris and in London about a century ago, and will perform all the original experiments, some of them with the very instruments which were used by the discoverers.

A VERY interesting acquisition has just been made by the botanical department of the British Museum. In 1783-4 John Millar made a series of water-colour drawings for the Earl of Bute, showing the "leaves, stalks, and ramifications of plants, for the purpose of ascertaining their several species." They are bound in five volumes, with an elaborately flourished title page, and fill 928 octavo pages. The museum has purchased the drawings.

THE seismograph on Mount Vesuvius is said to indicate great subterranean dynamism. Streams of lava continue to flow down the north-west side of the cone, and are increasing both in volume and number. "The Vesuvian eruption," the *Times* correspondent states, "has entered on a phase of greatly increased activity. The news reached us on Saturday, but, as it appeared only in those papers which are directly interested in the Funicular

Railway, it was looked upon as an exaggeration to attract Sunday excursionists. It is now, however, confirmed that the lava is flowing over the side towards Naples, and, after having destroyed the outwork built to protect the upper station of the railway, is running rapidly in a vivid streak of fire parallel to the line, but at a distance which does not thus far imperil its safety. The spectacle is described as magnificent, and crowds were out watching the course of the lava and speculating on the fate of the Funicular Railway."

AN International Congress of Electricians accompanied by an International Exposition of Electricity will be held in Paris during the autumn of 1881. This Exposition is to be opened (under the patronage of the Government, though at the pecuniary risk of private parties) on August 1, and to continue until November 15 following. The Congress of Electricians will meet on November 15 in the rooms of the Palace of the Trocadéro. Opportunity will be given for exhaustive research in all the various branches. The Exposition will remain open each evening until eleven o'clock to afford opportunities of testing the practicability of the different systems of electric lighting. The Congress is to assemble under the presidency of the Minister of Posts and Telegraphs, and the vice presidency of three French and three foreign delegates.

ON February 10, 1879, a few gentlemen interested in the study of man met in the Smithsonian Institution to devise a method of mutual improvement. The effort resulted in the formation of the Anthropological Society of Washington, with Major Powell for president, and Dr. Reynolds and Prof. O. T. Mason as recording and corresponding secretaries. Twenty-four papers have been read, which, if one might judge from their titles, are most interesting and valuable contributions. We learn from the *American Naturalist* that it is not yet decided whether a journal will be published, inasmuch as the Smithsonian Institution and the Bureau of Ethnology "afford ample opportunities of preserving all papers of permanent value." Without doubting this fact, we still hope that this young and vigorous society may not only have its own publication, but also that a long career of activity may ensue to provide the material for filling the pages of the same.

HERR V. BERGSÖ, in a recent work, "Fra Mark og Skov," has given some interesting data in regard to the habits of the Tarentula, *Lycosa tarentula*, Latr., whose nests he has traced and examined on the Roman Campagna. He found that the nest, which was well rounded and smooth, was approached by a tunnel which, after running about a foot straight down below the surface of the ground, made a sudden short turn before it finally descended for about another foot into the spider's abode. The entrance to the tunnel is concealed by an arched covering made by the interlacing of grasses and leaves. The eggs are inclosed in a spun bag, and the young appear in the autumn, when they immediately seat themselves on the body of the mother where they remain till about April, neither parent nor offspring seeking food during their hybernation. As many as 291 individuals were on one occasion removed in February from the body of an emaciated tarentula. The superstitious error of assuming that the bite of the animal induces an irresistible desire of dancing is due to the fact, that dancing having been originally employed as a remedy against the poison, which is believed to be eliminated by profuse perspiration, the action of the poison was confounded with the means of its eradication.

EXOTIC butterflies have long, from their beauty, engaged the enthusiastic attention of wealthy collectors, some of whom, as notably the late Mr. Hewiston, have also enriched entomological literature with works containing coloured figures of their favourite insects. M. C. Oberthür of Rennes, who, with his brother René, is the possessor of a very extensive entomological museum,

in which is contained the late Dr. Boissudval's collection of Lepidoptera, has just published his Quatrième livraison of a work, "Études d'Entomologie," which has more or less regularly appeared during the last few years. The present part is devoted to the "Papilionidæ" of his collection, and six coloured plates illustrate the species and varieties which he considers it necessary to describe.

MUCH interest has been excited in Norway by the recent appearance of a colony of beavers on the Voldifjord, a branch of the Frierfjord, which is at a considerable distance from the beaver-station still remaining at Omli on Nedenæs.

UNDER the title *Iagttagelser over Nordlys anstillede i Norge, Sverige og Danmark*, bearbejdede af Sophus Tromholt (Christiania), we have the results yielded by 839 observations of the aurora borealis, at 132 Scandinavian stations, on 154 nights, between September 1878 and April 1879 on which the northern light was visible. These observations are arranged under four heads in accordance with (1) longitude and latitude of stations; (2) time of year and age of moon; (3) colour, form, and altitude of streamers; (4) sound. Herr Tromholt considers that it may be accepted as certain, that the aurora is a local phenomenon, circumscribed by narrow limits, and manifested at inconsiderable distances from the earth's surface; that the light is generally white, and less often red or green, but that in latitudes higher than Bergen it not unfrequently presents spectral colours; and that the accompaniment of sound is an indisputable fact in relation to the auroral phenomenon. We learn from *Naturen* that Herr Tromholt has resumed his observations of the aurora borealis, to which he has devoted his attention for many years. It is his intention to make a catalogue of every recorded manifestation of the northern light in Norway; and for this purpose he requests the co-operation of other observers, and will be grateful for reference to any foreign sources of information, such as ships' logs, journals, weather tables, almanacs, &c., which might yield materials towards the better elucidation of this phenomenon.

IN a letter addressed to Mr. Cust by Prof. F. W. Newman, and just published in the *Journal* of the Royal Asiatic Society, on the Libyan languages, the writer remarks that St. Augustine in his own day attested that one language prevailed in Roman Africa, and that it was quite natural to suppose the same to be the case now, when a large and striking similarity was found in the leading nouns and verbs. The changes however induced in 1500 years have broken up the original unity, and Prof. Newman states that we are now forced to admit at least four languages, each differing from the other more than German from Dutch, or Portuguese from Spanish.

THE annual course of five lectures in connection with the Brown Institution will be delivered by Dr. W. S. Greenfield, Professor-Superintendent, in the theatre of the University of London, Burlington Gardens, W., on December 13, 15, 17, 20, and 22, at 5.30 p.m. Subject: Further Investigations on Anthrax and Allied Diseases in Man and Animals. Microscopic specimens will be exhibited on December 22 from 4.30 p.m.

WE learn from *Psyche* that Miss Emily A. Smith, a well-known entomologist of Peoria, Illinois, has gone to Leipzig, where, if the university authorities will allow it, she will pursue a general course of zoological work in the new laboratory of Prof. Leuckart. This lady was recently elected a member of the Entomological Society of London.

CAPT. H. KING, R.N., writes with reference to the instances of fascination mentioned at p. 56, vol. xxiii., that having heard that the American ostrich might be enticed within gunshot by a person lying upon his back and kicking his legs and arms in the



air, he tried this with perfect success in Uruguay; he supposes that curiosity was the motive. A large coral upon the copper of a man-of-war, Capt. King states, is not unprecedented; he remembers in 1839 seeing one of the size and shape of a large cauliflower, taken from the bottom of a vessel of the Indian navy, in the Persian Gulf, by a pearl-diver.

PROF. GRAHAM BELL has promised to read a paper before the Society of Arts upon his "Photophone" at the ordinary meeting on Wednesday, December 1. As considerable interest is likely to attach to this paper it is announced that only members of the Society can be admitted, and that they will be required to provide themselves with special tickets issued for the occasion.

We referred in the "Physical Notes" of our issue of November 11 to a paper read before the American Association at Boston by Prof. Young, which combated certain phenomena in thermo electricity which were alleged to have been observed by Herr Exner. We have since received from Mr. T. Brown of Belfast a letter in which, on behalf of Prof. Franz Exner of Vienna, he expressly disavows any such discoveries as those which Prof. Young has set himself to refute. We readily accord to our courteous correspondent the opportunity for this disavowal, since any reflections cast even inadvertently upon the accuracy of Prof. Franz Exner's work might unfairly prejudice readers against the general reliability of the researches which he has published in another department of science, and which our readers are aware are just now exciting considerable attention.

IN NATURE, vol. xxii, p. 616, it was stated, on the authority of the Japanese papers, that Prof. Atkinson had, "during a sojourn in the Mitake Mountains of the Province of Koshu, discovered another valuable deposit of coal." We are now informed that although Mr. Atkinson visited the Mitake Mountains last summer, he can lay no claim to so important a discovery.

THE Hon. Sir Ashley Eden, K.C.S.I., has appointed Babu Ambika Churn Sen, M.A., and Synd Sakhawat Hossein, B.A., a native of Behar, to the two scholarships of 200*l.* a year each, recently created by the Bengal Government to be held at the Royal Agricultural College, Cirencester.

THE Procureur-General of Paris having sent an explanatory note stating that he did not mean to attack the character of the medical advisers of the public prosecutor, but merely to give vent to his peculiar views, these gentlemen have withdrawn their resignations and resumed their work.

THE Cutlers' Company have arranged for a course of lectures being delivered, or papers read, at the hall of the company during the ensuing winter season. The course will consist of four lectures or papers upon subjects intimately connected with the materials used in the manufacture of cutlery, the lectures to take place on the following dates:—Wednesday, December 1, 1880; Wednesday, January 5, 1881; Wednesday, February 2, 1881; Wednesday, March 2, 1881. Sir Henry Bessemer, C.E., F.R.S., has promised to commence the course, and will, on December 1, read a paper "On the Manufacture and Uses of Steel, with special reference to its employment for Edge Tools." The admission will be entirely free, but by ticket, which may be obtained on application to the hon. secretary, addressed to the Cutlers' Hall.

It is announced that the electric cable manufacturing firm, Berthoud Borel and Co. of Cortaillod, in Neuchâtel, have made a highly important discovery in practical telegraphy. After a long and expensive series of experiments they have succeeded in devising a method of laying cables whereby the inductions of the electric current from one wire to another, although the wires are in juxtaposition, is prevented. This discovery, it is asserted, removes the last obstacle in the way of the widest possible extension of facilities for telephonic communication.

## OUR ASTRONOMICAL COLUMN

THE THIRD COMET OF 1869.—This comet, the orbit of which has so close a resemblance to that of the comet discovered by Mr. Swift on October 11, was detected at Marseilles by M. Tempel on November 27, 1869, in the constellation Pegasus, and appears to have been first observed on December 31 at Leipsic and Kremsmunster, the hope of seeing it after the next period of moonlight not having been verified. On November 29 Dr. Vogel, observing at Leipsic, described it as a very faint large object elongated in the direction of the declination circle; in the comet-seeker its diameter was about 6'. On December 7 it was still very faint, large, and elongated in the direction 300°, the central condensation very slight. On the following night its diameter was 5'; it had "a peculiar milky appearance" and hardly any central condensation, so that observations were attended with difficulty. On the 21st it was seen only with much exertion of the eye, but on the 31st, though the comet was very faint, Prof. Bruhns considered his separate comparisons certain to about ten seconds of arc. At Kremsmunster Prof. Strasser found it "extraordinarily faint" during its entire visibility, and in consequence of wanting central condensation, very difficult to observe, and hence considered that his positions would not possess the ordinary degree of accuracy. The elements of the orbit were calculated by Tiele, Oppolzer, Schulhof, and Bruhns, the parabolic orbit published by the latter in No. 1788 of the *Astronomische Nachrichten* being founded upon nearly the whole extent of observation; he remarks with respect to it:—"Eine angestellte Vergleichung hiesigen Beobachtungen scheint aber doch auf eine Abweichung der Bahn von der Parabel hinzudeuten . . ." We are not aware that any further examination of this point was made. If the period of revolution be really something less than eleven years, the circumstance of the comet having escaped observation prior to 1869 will not nevertheless occasion surprise, considering that both in 1869 and 1880 it has approached near the earth and has yet been very faint and diffused, so that when the perihelion passage has occurred at other seasons of the year it might be beyond reach of the telescope. It will be most essential for the theory of the comet's motion that observations should be continued as long as possible at the present appearance, that if it prove to be one of short period its next return to perihelion may be closely predicted: the computation of the planetary perturbations during the period 1869-80 will of course be a necessary process with this object in view.

THE STAR LALANDE 1013-4.—Mr. G. Knott has examined this star, to which we lately drew attention, as being credited with the very discordant magnitudes 5, 7.7, and 10. He writes from Cuckfield on November 21: "I looked the star up on November 8 and again on November 19, and found it on each occasion 7.9 mag., and sensibly equal to B.D. + 51°, No. 131, which forms a convenient comparison star. This estimate, it will be seen, agrees nearly with that in the *Durchmusterung*; Harding marks the star 6m.

## CHEMICAL NOTES

IN the last number of the *Berichte* of the German Chemical Society Herr v. Lippmann describes experiments which show that a solution of pure cane sugar, when charged with carbon dioxide, is slowly converted into inverted sugar. If the carbon dioxide be pumped into the sugar solution under pressure, the rate of inversion is considerably increased: at 100° the inversion takes place rapidly.

IN the *Annales Chim. et Phys.* the results of M. Raoult's experiments on the freezing points of alcoholic liquids are detailed. An aqueous solution of alcohol containing 1.6 per cent. by volume freezes at -0.5°; a solution containing 47.9 per cent. freezes at -32°. The freezing point of solutions containing from 24 to 51 gram alcohol per 100 gram. water is decreased by 0.528 for each gram of alcohol: when more than 51 gram. alcohol are present to 100 gram. water no regular decrease in the freezing point was observable. The freezing points of various wines are given in the paper referred to.

IN *Comptes rend.* M. Kessler announces that he has prepared a crystallised hydrate of hydrofluosilicic acid, viz.,  $\text{H}_2\text{SiF}_6 \cdot 2\text{H}_2\text{O}$ . The hydrate is a hard, colourless, very deliquescent solid, which fumes strongly in air, and melts at about 19°.